URBAN FUTURES: EXPLORING PARTICIPATORY, NORMATIVE, BACKCASTING APPROACHES IN DEVELOPING SUSTAINABLE STORYLINES FOR CHINESE URBANISATION TO 2050

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Abstract

Based on her seminal intervention (International Society for Ecological Economics, 1994) today Donnella Meadows would most likely argue that, if we want "to sustainably transform our urban future" we must first have a clear vision of how we desire that future to look like, and advocate a new scientific approach that we now call "sustainability science". Given what we know today about global change, tipping points and thresholds, which impose both an understanding of planetary challenges and their translation to the urban scale, Meadows call for envisioning is all-the-more challenging. However, failing to envision urban sustainability within the global context is almost certainly bound to invalidate the attempt to shift towards sustainable urban development. Drawing on a EU-funded research project on urbanization in China and Europe (URBACHINA) this paper reflects on the potential role of scenario building in promoting sustainable urban futures for China, and goes on to explore the challenges of exploring urban futures that are ecologically and socially sustainable in a global sense. It first summarises the rationale for the proposed framework, drawing on scenario-related literature (including several existing reports defining scenarios), with particular attention to the notions of normative scenarios, visions, backcasting and the importance of imagination for sustainability. It then outlines the participatory framework for urban sustainability scenarios. It finally summarises the test application of this framework the building of a set of qualitative scenarios for Chinese cities in 2050. The conclusion reflects on the strengths and weaknesses of the framework, and how these illuminate the wider challenges and opportunities for improving our capacity to design sustainable urban scenarios. The URBACHINA forward looking process is innovative in its combination of a participatory iterative process with normative approaches, that provides the possibility to question deeply ingrained development models through envisioning processes. The additional challenge has been to propose such an approach to envisioning the future in the Chinese context, which is strongly influenced by plan-based policy and decision making. The experience confirms the power of scenario/storyline building as a means to reflect and learn.

Keywords: participatory visions, normative scenarios, urban sustainability

1) Introduction

"The ultimate goal of foresight is sustainable development in a changing world"

(C. Stoffaës, 2001)

Futures studies and scenario planning have gained considerable importance lately in response to uncertainties and risks brought in by globalization, economic, ecological, social and geopolitical crises that threaten the pursuit of progress across world regions. Scenario building, as a long-term planning tool, is particularly appropriate for informing policy-makers and business leaders facing decisions in an increasingly complex and interdependent world.

Two decades ago, in her seminal intervention (International Society for Ecological Economics, 1994) Donnella Meadows argued that 'even if information, models, and implementation could be perfect in every way, how far can they guide us, if we know what direction we want to move away from, but not what direction we want to go toward?' That sense of direction, when the aim is to move to a sustainable world – as *Stoffaës* reminds us – continues to be elusive, both within nations and most poignantly at global level. Given what we know today about global change, tipping points and thresholds, which impose both an understanding of planetary challenges and their translation to the urban scale, Meadows call for envisioning is all-the-more challenging. Yet, ultimately, sustainability in the era of the Anthropocene (PUP 2012) can only be achieved if the global community shifts towards it, with all due concern for the issue of justice and responsibility that have vexed debates and policy making since 1992's United Nations Conference in Rio (UNCED 1992).

Almost a decade later, these concerns have driven the Global Scenario Group, through the work of Raskin et al (2002) to define a global transition initiative (GTI): *a new sustainability paradigm* that 'would challenge both the viability and desirability of conventional values, economic structures and social arrangements. It would offer a positive vision of a civilized form of globalization for the whole human family'. They warned that 'it is all too easy to envision a dismal future of impoverished people, cultures and nature' and called for a more hopeful, normative, scenario building effort. This appeal is further supported exactly two decades since Meadow's speech, by the recent work of Costanza and co-authors (2014) arguing that 'creating a shared vision of a sustainable and desirable future is the most critical task facing humanity today'.

In this context of crisis, interdependence and the need for a globally shared vision of sustainable futures, urban development is perhaps the single most striking driving force for change in the 21st century. And within this arena, Chinese urbanisation is one of the fastest growing challenges: each year, 10 million people migrate from rural to urban areas, a flow predicted to add up to 350 million new residents in urban areas by 2030, leading to an urban population of 900 million by 2050 (OECD and CDRF 2010); and overall energy demand in China is expected to more than double between 2015 and 2025, with urban demand reaching 85 to 90% of total demand (Bina *et al.* 2013). Drawing on a EU-funded research project on urbanization in China and Europe (URBACHINA) this paper reflects on the potential role of scenario building in promoting sustainable urban futures for China, and goes on to explore the challenges of exploring urban futures that are ecologically and socially sustainable in a global sense.

It first summarises the rationale for the proposed framework, drawing on scenario-related literature (including several existing reports defining scenarios), with particular attention to the

notions of normative scenarios, visions, backcasting and the importance of imagination for sustainability. It then outlines the participatory framework for urban sustainability scenarios. It finally summarises the test application of this framework the building of a set of qualitative scenarios for Chinese cities in 2050. The conclusion reflects on the strengths and weaknesses of the framework, and how these illuminate the wider challenges and opportunities for improving our capacity to design sustainable urban scenarios.

2) Methodological approach

Before embarking on the development of URBACHINA's scenarios we reviewed some of the recent literature on the subject (Eames et al., 2013; Guell and Redondo, 2012; Hartmann, 2011; Inayatullah, 2011; Mahmud 2011; Phdungsilp, 2011; Ratcliffe and Krawczyk, 2011), as well as 34 recent scenario studies, including: 17 focussed on urban futures and 17 related to global futures; of which 18 relating to China and the remainder from Europe and the rest of the world (see Annex 1) - to provide us with an overview of the latest approaches. The review explored in particular the methods, scope, process, level of participation, themes discussed and wild cards considered.

The literature on futures studies suggests there are three main reasons for engaging in urban futures studies and scenarios:

(i) the growing complexity of urban systems and the resulting need to extend traditional planning horizons;

(ii) the intrinsic relationship between strategic planning and futures studies (both deal with long-term development visions);

(iii) the social debate and stakeholder collaboration inherent to urban planning can be best achieved around holistic visions of the urban future (which scenarization can produce).

Within URBACHINA, the reasons for embarking on a scenario exercise were twofold: a) to use storylines to illustrate alternative futures combining exploratory and normative approaches, and b) to use the resulting storylines to explore and reflect on the nature and direction of the current policy discourse around China's urban future, and on the implications of URBACHINA's findings for sustainable urban futures.

The approach adopted to build the URBACHINA scenarios is in line with the "traditional" scenario building methodologies that emphasise the participatory dimension. It relies on the inputs provided by a wide community of experts from all world regions through two surveys and a series of five dedicated workshops (figure 1), over a period of two years. Altogether, contributions have thus been elicited from over 200 between scholars, city administrators and urban planners, policy makers and representatives of civil society. The majority of participants to the workshops were Chinese, while respondents to the surveys originated from China (ca. 30%), Europe (ca. 50%) and other world regions (ca. 20%). Applying such a participatory approach to the specific challenge of sustainable urbanization in China is a new experience.

In the next section, rather than describing the details of the process and of the corresponding outcome, we therefore highlight the main lessons learned at each step of the process, with particular emphasis on those findings that owe their originality to the specific context of the exercise.

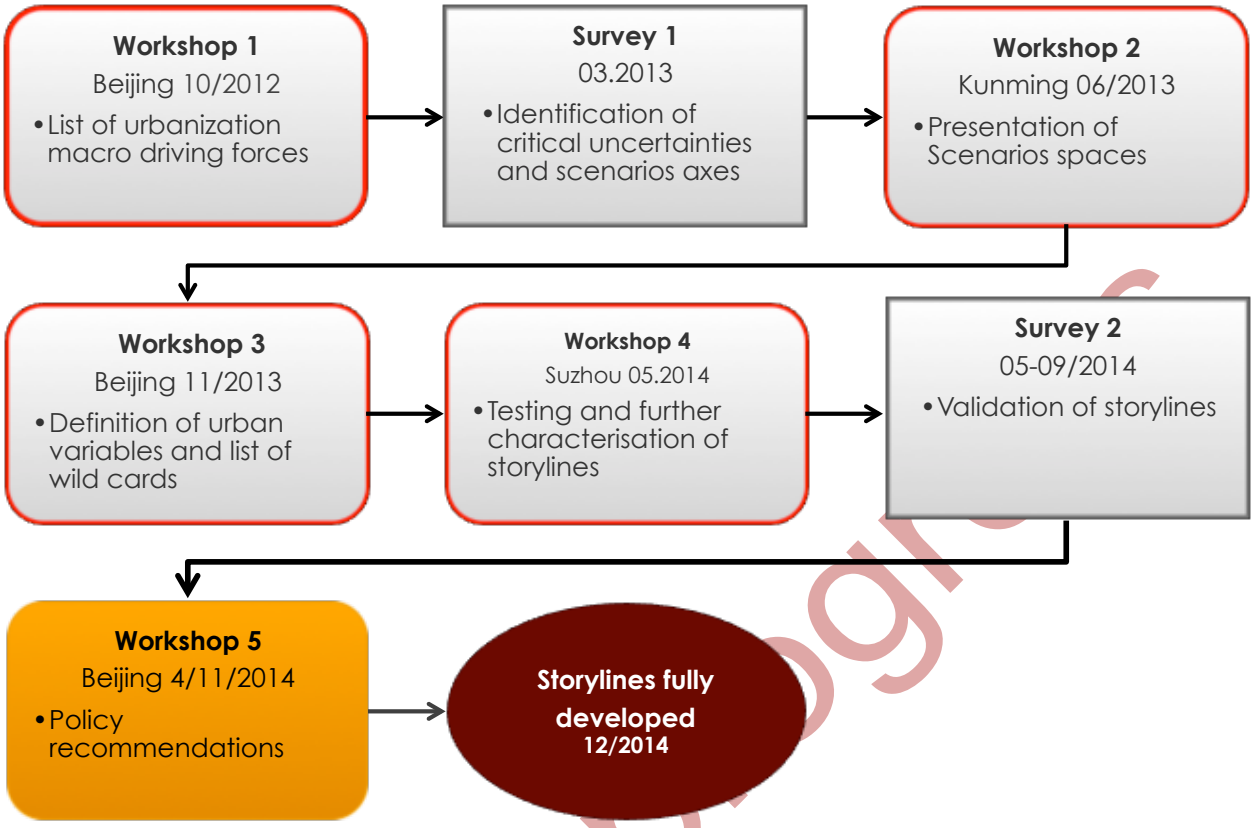

Figure 1: The URBACHINA participatory scenario building process

3) Results, discussion and implications

3.1) Critical uncertainties and driving forces of change

A first step has led to the identification of critical uncertainties (drivers of change that are expected to play a major role in shaping the future of Chinese cities, but whose possible evolution is largely unpredictable).

Step 1: WS1 - The first workshop served to introduce the scenario methodology and summarise the context and main goals of the URBACHINA ambition. It led to the identification of the most important forces expected to drive the urbanization phenomenon in China at the 2050 horizon:

i. Population ageing
ii. The increase in the cost of labour
iii. The speed of urbanisation
iv. Technological progress
v. The optimisation of land use
vi. The development of urban infrastructure systems
vii. The policy shift from the urbanisation of land to the urbanisation of people
viii. The increased attention to the development of human capital

ix. The reform of the *hukou* system (residential status and permits)

These turned out to be on the one hand *macro drivers* that affect the overall socio-economic framework of China, such as the ageing of population, the increase in the cost of labour, the pace of technological progress and its impact on economic efficiency, and the increasing attention towards the development of human capital, but also drivers that bear a specific relevance in the urban framework, such as the optimisation of land use, the increasing attention towards the urbanization of people (as opposed to the urbanization of land), and policy reforms such as notably that of the *hukou* system. Issues of social and economic justice were clearly part of the concerns, uncertainties and drivers discussed. Far less attention was given to ecological issues, despite the many significant problems in this domain in China (and their global implications, notably in terms of GHG emissions, but also in terms of regional water resources, for example). As shown in Table 1, even though the scope of the studies tended to be narrower (see Table 2) many of these drivers find echo in the urban studies reviewed at the beginning of the project.

Urban Studies - Areas	**Type of Policy goals**
The review includes the following cases: 12 Chinese studies, 1 USA 3 EU (UK, ES, NL) 1 Indonesia Details: • Cities of Istanbul and Mumbai • City region of Bristol, England • Region of Bulungan, Indonesia • Jinyun County, in Lishui City, Zhejiang Province, China • Wuxi, Jiangsu Province, China • Binghamton Metropolitan Transportation Study • The city of Donostia - San Sebastian • The region of Ranstand • The city of London • Beijing (2) • Yellow River Basin • Haikou City	To balance the speed of urbanization and quality of life To assess the impacts of urbanization policy on land use change To find new solutions for urban mobility To achieve integrated regional development To generate consensual scenarios for a region To explore China's urbanization futures To devise socio-technical scenarios for the retrofit of core UK city-regions To develop a cross-sectoral integrated low carbon strategy for city of Wuxi To guide the urbanization decisions of policymakers To predict different levels of carbon emissions To give advice on energy-saving buildings To explore strategies for developing a low-emission city To provide reference data to future urban planning To devise sustainable ways for city development To balance the speed of urbanisation and land consumption

Table 1 Summary of the urban studies focus and broad policy goals

Lessons learned: interestingly, the main challenge was to generate acceptance on the very concept of “several, possible, alternative futures”, which is at the core of the foresight approach. In a planned economy such as China, the future is defined as a target to be achieved in the short/medium term, and the added value that can derive from the comparative assessment of long term contrasted visions is difficult to recognize. This cultural resistance declined over the

subsequent steps but never fully disappeared. Resistance to normative and desirable futures remains especially strong, however, as discussed below, the second survey revealed interesting developments.

	From the Urban Scenario Studies:		
From URBACHINA's survey and workshops	**Themes included as urban variables and critical uncertainties (used to build axes)**	**Other urban variables and critical uncertainties**	**CATEGORISATION of themes**
Total factor productivity	Technology and behavioural solutions, ICT, Technology related to the use of electricity	Technology policy, Innovation	Economy and technology
Total factor productivity	Economic growth (increase personal welfare, public private partnerships), Per capita GDP	GDP	Economy, institutions, governance
Regulation of sublevels of government, Fiscal Reform	Regional development (economic vs social orientation), regional and local economy (growth)		Economy, institutions, governance
	Government attitude towards free trade (liberal vs conservative)	Globalisation (impact)	Economy, institutions, governance
% GDP generated by different sectors	Economic structure, Industrial structure		Economy, institutions, governance
Social values and consumption patterns	Consumption (local and global)	The economy	Economy, institutions, governance
Labour cost reforms, Stock of urban jobs, Evolution of wages, Cost of integrating migrantes, Human capital development	Labour, Wages	Migration flow	Economy, institutions, governance And Society and social policy
Air quality	Climate change, Carbon emissions (industrial sectors, other, per unit of GDP)		Environment and resources
	Environmental/Ecological protection	Prevention of natural disasters	Environment and resources
Energy	Energy (demand/consumption/intensity), Consumption per 10,000 RMB/GDP		Environment and resources Economy, institutions, governance
Water, Water quality	Water consumption (Industrial/Agriculture/Domestic water consumption)	Irrigation area (scale of)	Environment and resources
Loss of arable land	Agriculture, Arable land, Forest and grassland area	Food security	Environment and resources

Waste			
	Type of society (individual/collective)	Social issues, social structures/status, social ideology	Society and social policy
Availability of health services, Availability of school, Health	Society, economy and wellbeing	Health	Society and social policy
Social values and consumption patterns	Lifestyle	Mobility of people/goods/capital	Society and social policy
Hukou reforms, Tot population, Urban population, Child policy, Fertility, Age structure	Population (ageing, decreasing household size, international migration)	Population (increase), Demographic distribution	Society and social policy Economy, institutions, governance
Planning reform	Urbanisation drivers: planning/centralised vs markets	Urban planning	Urbanisation and planning
Land use efficiency, Amount of greenfield development, Amount of brownfield and infill redevelopment	Land-use patterns/demand, Built-up area per capita, Urban expansion, Urban traffic systems		Urbanisation and planning
Investment in infrastructures, Mobility infrastructures (car and public transport)	Transport (infrastructure)		Urbanisation and planning Economy, institutions, governance

Table 2 Comparing URBACHINA and other urban future studies lists of variables and uncertainties

Step 2: Survey 1 - The first URBACHINA survey aimed at enhancing and validating the driving forces, and selecting the critical uncertainties to be retained for the structuring of the scenario space. In order to effectively gauge the structuring power of the critical uncertainties, the survey also proposed a series of basic indicators and associated ranges of possible, future variations.

As shown in table 3, none of the proposed driving forces scored high on both importance and uncertainty.

	Importance	Uncertainty
Urbanization growth	1	4
Urbanization and equality policies	1	3
Human capital development	1	3
Land use optimization	2	2
Population ageing	2	3
Infrastructure investments	3	2
Hukou reform	3	2
Cost of labour increase	3	1
Total Factor Productivity	4	2

Table 3 Drivers of change and critical uncertainties in URBACHINA

The survey revealed that drivers that are currently considered of paramount importance for mature economies (and particularly for the EU in a period of crisis), such as the cost of labour, or productivity, are perceived of lesser importance in the current Chinese context, while the nature and extent of reforms in social policies appear to be shrouded in uncertainty.

3.2) Scenario space and initial categorisation

Based on the drivers identified through a workshop and survey, the second step required the proposition of a scenario logic. While no straightforward selection of critical uncertainties was thus possible, clustering several candidate topics led to the identification of two main dimensions apt to effectively structure the scenario frame:

- the pace of economic growth, or rather, the extent to which economic growth will remain the prevailing driver of urbanization policies
- the nature, speed and extent of policy reforms, particularly those that aim at reducing inequalities, promoting human capital development and inclusiveness

The resulting scenario space allowed us to build four preliminary categories of scenarios, combining high and low values for each dimension (figure 2), which were presented at a workshop in Kunming for discussion with URBACHINA members and stakeholders.

Figure 2 URBACHINA scenario space and first scenario categorisation

Step 3: WS2 (Kunming) - The second workshop focused on the discussion and validation of the scenario space and of the first scenario profiles summarised in figure 2.

While recognizing the prominent role of the proposed macro drivers, and accordingly acknowledging the overall meaningfulness of the scenarios, the workshop led to recommend that a more urban-specific characterization be developed. Also, the above-mentioned resistance towards embracing a long term perspective translated into a plea for introducing an intermediate horizon in the foresight exercise, arguing that policy makers (the targeted end users of the scenarios) can only be expected to be effectively engaged if policy targets can be linked to the timeframe of the traditional planning cycle.

On the other hand, it was noted that a future that would encompass no significant reforms lacks a realistic base, leading to recommend that the further scenario elaboration be focused on the top two storylines, tentatively labelled *harmonious dragon* and *hard-line superpower*, respectively. Such choice was consistent with the two reasons defined above for exploring alternative futures through scenarios and storylines, which ultimately aim to explore possible and desirable (sustainable) futures, rather than negative downturns or strict BAU.

3.3) Urban variables and wild cards

Step 4: WS3 (Beijing) – Based on the narrative of the scenarios developed in the previous steps, the third workshop discussed their urban dimension and led to the identification of a tentative set of variables and indicators to translate the macro drivers into urban ones, covering a broad range including demography (household size, migrants), resources and environment (access to drinking water, green urban spaces), technology (ICT-based services), mobility (level of service, car ownership, accessibility of public transport), urban economy and labour market, access to services (health, education), values and lifestyles, urban governance etc.

The attempt to cluster Chinese cities according to differentiated patterns based on such indicators proved however difficult and was not further pursued.

On the other hand, the interaction with Chinese experts emphasized the strong resistance towards envisaging radical changes in deeply ingrained paradigms, such as the priority of GDP-based economic growth, which remains the incontrovertible driving force, and the highly sensitive nature of governance-related topics and variables, hardly amenable to an open discussion within the group.

Such inertia in future thinking was confirmed by the classification as “wild cards” of possible radical changes such as democratisation, or the fragility of infrastructure that, despite they largely fall in the realm of realistic and at times probable (at least in the long term) evolutions, were considered as beyond the reasonably envisageable. A further illustration of this was the consideration of the elimination of the registration system (Hukou) as a wild card.

Based on the discussions and follow-up analysis, the scenario space and broad categorisations were amended (see Figure 3).

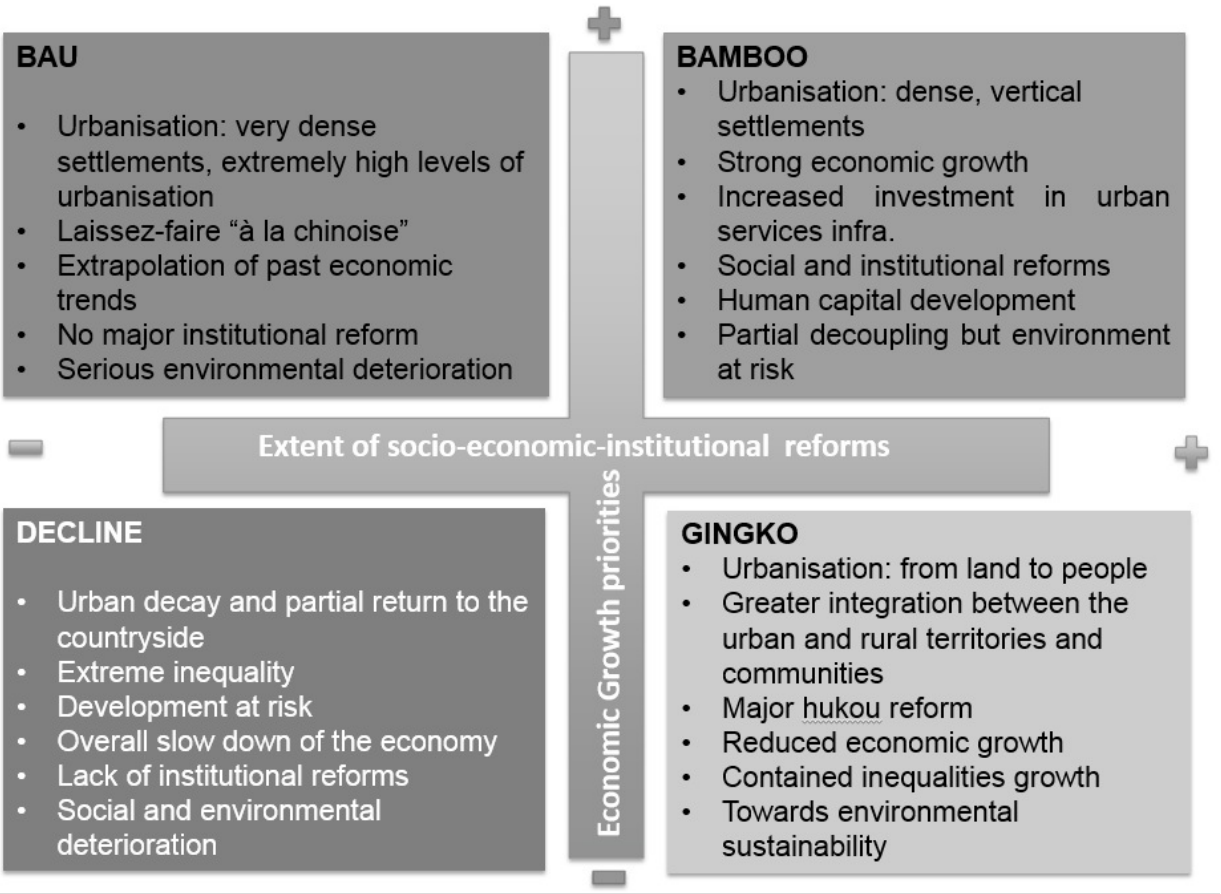

Figure 3 Revised Categorisation of scenarios for URBACHINA

Based on these new typologies, it was decided to develop two main storylines:

- the "Bamboo" storyline, featuring rapid, unregulated growth, and accelerated pace of production and consumption, constant change (preferred to systemic resilience) associated with the triumph of a global economic dimension
- the "Gingko biloba" storyline, pointing to a solid, slow and more structured growth, with strong roots in the contextual socio-economic and ecological environment, and a progressive build-up of systemic resilience, where the regulative dimension prevails as a driver.

3.4) Testing two new storylines

Step 5: WS4 (Suzhou) – Focus on the new draft of two storylines: Bamboo and Gingko; and a preliminary analysis of the relevance of the new *National New-type Urbanization Plan (NUP 2014-2020),* issued by the Central Committee of the Communist Party of China and the State Council (State Council 2014).

This workshop adopted the world café methodology, thus allowing participants to explore each of the four main themes around which the two storylines were developed: 1) urban planning and design, 2) society and social policy, 3) urban governance and local economy, 4) resources and environment. In order to ensure consistency across the tables and groups, participants were asked to focus on intermediate cities rather than megacities or towns and villages. The results and main outcomes are summarised in Box 1. These helped to re-write the storylines and include further detail for each of the four themes.

Main findings:

- Financing Urban Development and public services (public transportation; water supply): transition from a land-sell based model to a combination of systems (property taxation; private investments in delivering public services, etc.). *Relative disadvantages of intermediate cities in having access to private investments*. Desired outcomes: strengthening local institutions (banks) and attracting foreign investments;

- Multi-level governance: strengthening the role of *urban governance (for urban clusters*) or metropolitan governance, rethinking the role of provinces in Midland China, subsidiarity. Desired outcomes: collaborative planning approaches for reducing the competition in resource allocation;

- Sustainable use of local resources, considering the co-existence of a manufacture-based local economy with other forms of emerging activities in particular special economic zones, located in intermediate cities, for fostering the gradual transition towards a knowledge-based economy; similarly intermediate cities are rich in natural resources, natural/cultural landscapes, minor heritage. Desired outcomes: diversification of mass tourism (especially domestic) towards other tourist destinations in inland China

- Local (Neighbourhood) Governance and participation. Strengthening the role local democratic processes and residence-based forms of involvement, especially in inner city redevelopment. Potential advantages of intermediate cities in introducing more easily *participatory planning approaches* (rather than mega-cities) considering the potential role of *locally elected people* (in contract with career-oriented local officials in mega-cities);

- Professionalism in Urban Planning and Design. Strengthening the role of town planning in China through education (the role of University) and within the current institutional environment: at the municipal and central level (planning committee in central government, counterbalancing the power of the Economic Reform Commission);

- Conversion from rural into urban and mechanisms of compensation for peri-urban farmers. Strengthening the transparency of compensation scheme testing, moreover, forms of land right transfer (shifting the livelihood from the country to the city), reducing income inequality and achieving greater social justice, although considering the side social effects of passive urbanisation;

- Promoting the integration of rural migrants. Hukou system reform: increasing the rights to services, narrowing the gap between rural and urban areas; shifting Hukou to the provincial level, etc.;

- Promoting a less resource-consuming lifestyle in the phase of upgrading from rural into urban. Strengthening *the role of education (schools and University) in Midland China* containing extreme individualistic attitudes or general conservative culture (different from the openness of the coast). Risk of excess of consumerism due to the forecast of growth of middle-class in intermediate cities;

- Balancing the trade-off between city growth and food security, considering that Midland China is the last reservoir of agricultural land but also in risk of extreme suburbanisation, following a trend already in place in mega-cities; Strength: high reliance of intermediate cities on regional food, how to maintain or improve the existing trend;

- Efficient water management, considering natural factors (morphology and climate) of Midland China; how to reduce the waste of water: environmental awareness, technical solutions, etc.; How to combine agricultural activities and water usage;

- Optimisation and diversification of the energy structure, reducing the role of coal industry, especially in some areas of inland China; overall improvement of renewable energy;

- Improving the system of transportation and mobility. Strengthening the connection between the coast and inland China and promoting *integrated transport systems, suitable for intermediate cities* (particularly considering the link between urban and rural areas). Experimented systems of transit oriented development (TOD and compact use of space).

Box 1: Main results from the participatory workshop in Suzhou.

The second output from the Suzhou workshop was the confirmation of the significance of the new urban plan - NUP 2014-2020 (State Council 2014) as key policy target that would give the URBACHINA process the possibility of reflecting on the intermediate stage of 2020, as requested by participants at the Kunming workshop. The NUP is the first such plan for China, (Li *et al.* 2014 ; Verdini 2014) and during the Suzhou discussions it became clear that it carries the potential for addressing several of the key drivers identified in URBACHINA's first workshop and first survey. Thus, a preliminary list of main areas of relevance for further analysis during the backcasting stage of the scenario process was identified.

3.5) Testing the storylines' plausibility and desirability

Step 6: Survey 2 – The second survey aimed at testing and validating the new storylines, and providing initial input to the backcasting exercise. Given the nature of the questions the survey required approximately one hour to complete and resulted in 63 valid responses (Figure 4).

Gingko Daily - Plausibility	YES	NO
Urban governance	65%	35%
Economy	61%	39%
Lifestyle	65%	35%
City planning & life	76%	24%
	67%	**33%**

Gingko Daily - Desirability	YES	NO
Urban governance	89%	11%
Economy	82%	18%
Lifestyle	91%	9%
City planning & life	88%	12%
	87,5%	**12,5%**

The Bamboo Time - Plausibility	YES	NO
Urban governance	92%	8%
Economy	76%	24%
Lifestyle	82%	18%
City planning & life	88%	12%
	84%	**16%**

The Bamboo Time - if current policy framework could possibly lead to such a vision	YES	NO
Urban governance	78%	22%
Economy	74%	26%
Lifestyle	73%	27%
City planning & life	76%	24%
	75%	**25%**

Figure 4 Summary of the main results of the second survey

Both storylines were found highly plausible and internally consistent (see Figure 4), as a whole and for what concerns their main individual dimensions (urban governance, economy, lifestyles and city planning). Interestingly, the Gingko scenario, although it illustrates a true paradigm shift, scored high in plausibility and very high in desirability, with an overwhelming 87.5 % of respondents advocating its pursuance. This lends a solid credibility to the entire exercise, and most importantly - from the methodological viewpoint - demonstrates the value of the participatory iterative approach: despite the many resistances encountered along the process as Chinese participants were repeatedly constrained by the short-termism typical of planning-oriented approaches, and by the associated difficulty in thinking “out of the box” and in accepting to discuss paradigm shifts, the final outcome suggests that the scenario building process ultimately managed to largely win over such resistances and generate acceptance of radically new long term visions that are deemed credible *and* desirable.

This result has wider implications for the scenario work that aims to explore sustainability paths. Work which, as mentioned in the introduction, is seen as not just desirable but essential and urgent by many. The definition of a widely shared vision of the future that is profoundly transformative in the direction of greater social justice, ecological sustainability and economic viability is precisely the missing step that Meadows claimed to be a condition sine qua non for making progress. Our project, while extremely limited in its means and reach to be in anyway representative of the case in question (i.e. Chinese urbanisation as a whole), nonetheless provides support for this ethos, which in turn informs the work of an increasing number of scholars, practitioners and stakeholders, including Raskin and Costanza cited earlier.

3.6) Backcasting and policy relevance

Step 7: Workshop 5 (Beijing) - The last participatory step in the process was a workshop to discuss and validate the findings from the survey (step 6) and to have a roundtable discussion around backcasting with reference to the Bamboo and Gingko scenarios, given their high plausibility and desirability. The demand to include a mid-term stage in the scenario process was made in Kunming, based on the argument that 2050 is too far and that it would be good to reason in terms of policy implications of any storyline for a period to 2020, which is an important target date in the Chinese context as it coincides with the end of the 13th Five Year Plan (currently being prepared) and it is also the target year for - NUP 2014-2020 (State Council 2014) discussed in Step 5.

The idea was therefore to take the NUP as a reference point for a mid-term step between 2050 and today, asking the question: to what extent does the NUP contribute to transition towards one or the other storyline?

In order to answer the question we identified 13 categories of objectives (Table 4) broken down into 43 more detailed aims (including quantitative targets) and for each we evaluated the likelihood (or not) of each aim contributing towards the aims and changes implied by each storyline. The analysis only envisages a simple scale: 3 = has the potential to contribute; 2 = has limited potential to contribute; 1= no contribution.

URBACHINA focus areas: Economy/Planning-Governance Society/Environment	Major NUP Objectives
Economy	Industry
Economy	Green Econ
Economy	Finance and Governance
Planning-Governance	Land
Planning-Governance	Hierarchy of cities
Planning-Governance	Coordination policies
Planning-Governance	Greening
Planning-Governance / Economy	Administration
Planning-Governance/Economy	Urban Transport and links
Planning-Governance /Society	Pleasant and well served
Society	Urban residents & Migrant hukou
Environment	Air and water
Environment	Resources and environment

Table 4 Categorisation of the Major Objectives in the NUP

Table 5 shows an extract of the analytical table developed to answer the question about the NUP and the storylines. This was discussed in detail in Beijing. By and large, the evaluation suggests that NUP contributes to both storylines, and that – as to be expected – it does so more for Bamboo (closer to BAU) than for Gingko. In terms of the latter, the themes that are not

consistent with it are: issues of land use, of territorial governance, and around the use of the hukou system.

Lessons learnt: the simple exercise of backasting using the intermediate target of an existing policy statement has provided the additional advantage of improving the internal consistency of the two storylines, by allowing all participants to think in detail at their implementation using the 43 aims as a platform for discussion. Backcasting is especially appropriate for the exploration of sustainable city futures, given the normative dimension and has therefore been widely applied over the last decade. In URBACHINA's process, it has demonstrated its potential as well as the cultural and governance limits of its applicability given the obstacles to normative projects that do not arise from central government.

Objective – main category	Detailed aims	Bamboo	Gingko
Land	**Optimise** spatial layout and form, respect **ecological carrying capacity**	**2**	3
	follow the 'National main **functional** area plan'	3	**2**
	accelerate the improvement of development **management** system for urbanization areas, agricultural producing areas and **key ecological** function zones	**2**	3
	build resource and environment **carrying capacity** monitoring and early **warning** mechanisms	**2**	3
	To form a unified urban and rural construction **land market**	3	3
Hierarchy of cities	NUP aims to **decongest** the mega cities of the coast, incentivising permanent residence in the urban clusters of central / midland and western China (State Council 2014: Part 4; Verdini 2014)	**2**	3
	while increasing the number of **small and medium** cities	1	3

Table 5: Extract from the analytical table confronting NUP objectives and storylines

3.7) The global dimension: wanted

The participatory process followed in URBACHINA's scenario exercise simply did not lead to the identification of this global objective and perspective, especially in terms of ecological sustainability. Nonetheless, there are a few reflections worth sharing on the challenges of exploring urban futures that are ecologically and socially sustainable in a global sense. First, our experience here has confirmed, once more, that scenario categorisations tend to fall within archetypal types that have marked the characterisation of alternative futures through the ages (Clardy 2011). This idea is discussed in detail, specifically in terms of 'archetypal worldviews' that influence, inform and shape scenario-building and envisioning, by Raskin and colleagues (2002). Figure 5 presents their main archetypal worldviews in a figure that echoes the URBACHINA scenario space in Figure XXX above: essentially there is a perfect overlap between the two, while the 'conventional' and 'great transitions' worldviews coincide with the spirit of the Bamboo and Gingko storylines, respectively.

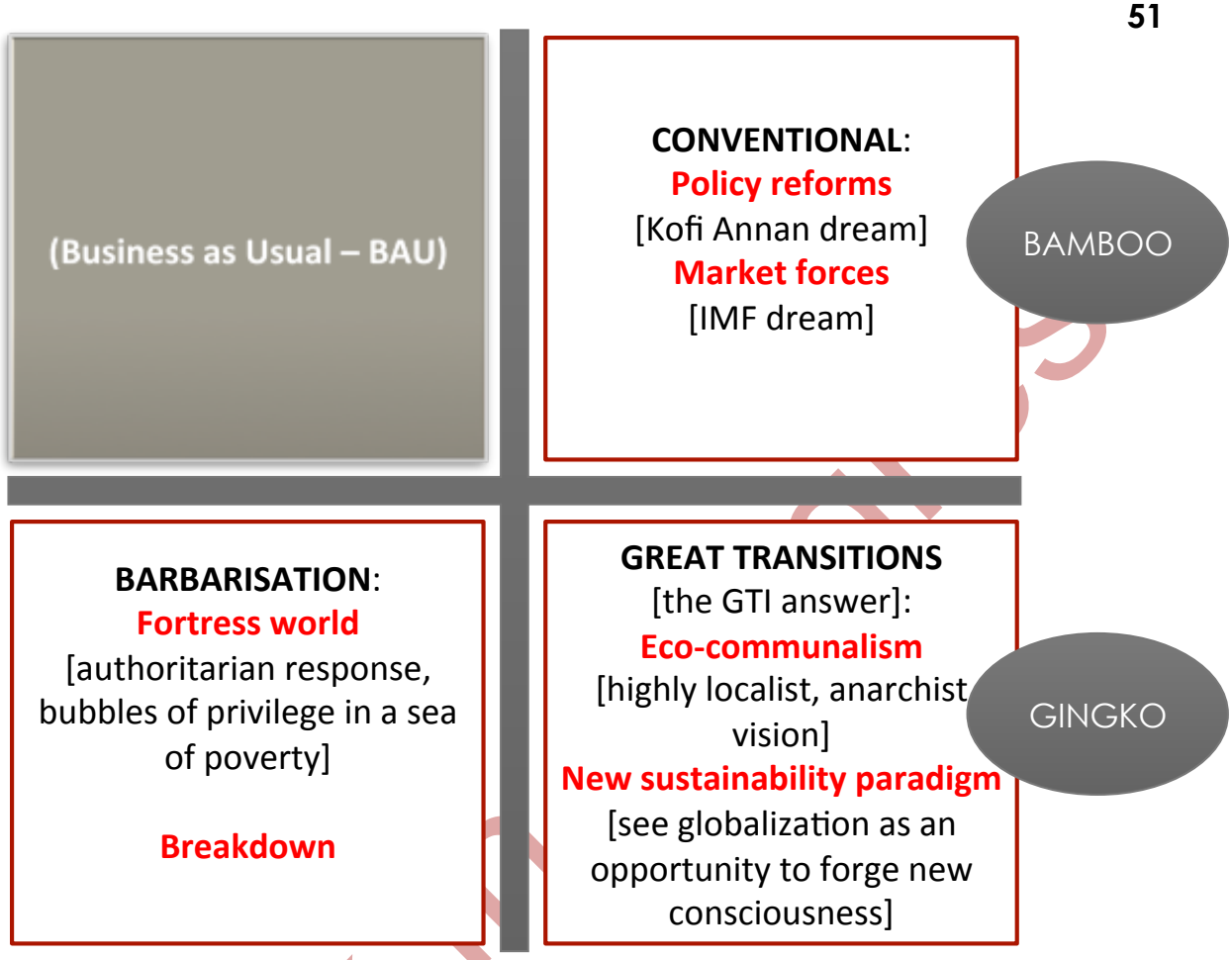

Figure 5 Archetypal worldviews (Raskin et al 2002) and URBACHINA's storylines

4) Conclusions

The URBACHINA forward looking process is innovative in its combination of a participatory iterative process with normative approaches, that provides the possibility to question deeply ingrained development models through envisioning processes. The additional challenge has been to propose such an approach to envisioning the future in the Chinese context, which is strongly influenced by plan-based policy and decision making. The experience confirms the power of scenario/storyline building as a means to reflect and learn.

In practice, the rigidity, and top down planning mode inhibits, as to be expected, imagination and normative approaches to scenario building. This, together with related cultural traits, leads to difficulties and resistance to imagine a future where some of the current prevailing features and constraints are removed or radically changed. This difficulty in accepting the idea that there might be highly differentiated possible futures leads to the incorrect definition (or perception) of some uncertainties as wild cards (e.g. the end of the Hukou system).

Hence, the limits of the process combine cultural (historical habit of pre-determined futures) and political (top-down binding targets and behaviours) dimensions. Nonethelss, it is noteworthy that when a radically alternative scenario is presented, framed with detailed attention to the character and peculiarity of the socio-economic, cultural and environmental context, the feedback is positive both in terms of plausibility and desirability.

Ultimately, the aspiration transpiring from the experts' feedback points towards a rather shared vision of "utopian" future, confirming Raskin's and colleagues' suggestion that all scenario work ultimately falls within a set of archetypal images of the future.

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Annex – list of studies reviewed

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4.	UNDP (2013) China Human Development Report. 2013: Sustainable and Liveable Cities: Toward Ecological Urbanisation, United Nations Development Program, China Translation and Publishing Corporation, Beijing,	UNDP (2013) http://www.cn.undp.org/content/dam/china/docs/Publications/UNDP-CH_2013%20NHDR_EN.pdf
5.	OECD Environmental Outlook to 2050, OECD Publishing	OECD (2012) http://dx.doi.org/10.1787/9789264122246-en
6.	Forum of the Future (2010), Megacities on the move: your guide to the future of sustainable urban mobility in 2040	FoF (2010) http://www.forumforthefuture.org/sites/default/files/project/downloads/megacitiesfullreport.pdf
7.	Michaël van Cutsem (2010), Cities of tomorrow - Challenges, visions, dys-visions as seen by cities, European Commission – DG Regio, Foresight Unit	Van Cutsen (2010) http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/citiesoftomorrow/citiesoftomorrow_foresight.pdf
8.	McKinsey Global Institute (?) Visualizing alternatives for China's urban growth (graphic highlights on four-alternative scenarios for urbanization in China and the potential impact on the economy, natural resources, transport, floor space, jobs, and skills.)	MGI (?) http://www.mckinsey.com/tools/Wrappers/Wrapper.aspx?sid=%7B6FDAB687-4E4B-45A6-95BB-534DCA65A88D%7D&pid=%7BFBAF9096-1C5A-4955-BEBB-295CF59A47A0
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19.	Scenario Simulation of Future Urbanization and Its Resource & Environment Effects in Jiangsu Province	CNKI http://www.cnki.com.cn/Article/CJFDTotal-DLGT200702014.htm
20.	Scenario Analysis of China's Energy and Electricity Consumption and Level of Carbon Emission	CNKI http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=1&recid=&filename=ZGLN200903013&dbname=CJFD0910&dbcode=CJFQ&pr=&urlid=&yx=&uid=WEEvREcwSlJHSldTTGJhYlNPQUFQUmc1NGhWSFdIUlpmamZ0MWtqbFRabFFTaWlMNm1HTW5WMElFMncrZG5sUQ==&v=Mjk0MjZZUzdEaDFUM3FUcldNMUZyQ1VSTG1lWnVackZ5RG1VYi9QUHlySFlMRzRIdGpNckk5RVo0UjhlWDFMdXg=
21.	Analysis on China's Energy Consumption and Carbon Emission Scenario by Input-Output Method	CNKI http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=4&CurRec=1&recid=&filename=BFHJ201205045&dbname=CJFD1112&dbcode=CJFQ&pr=&urlid=&yx=&uid=WEEvREcwSlJHSldTTGJhYlNPQUFQUmc1NGhWSFdIUlpmamZ0MWtqbFRabFFTaWlMNm1HTW5WMElFMncrZG5sUQ==&v=MTEwMjdlWnVackZ5RG1WcnpJSnl2

		RFpMRzRIOVBNcW85QllZUjhlWDFMdXhZUzdEaDFUM3FUcldNMUZyQ1VSTG0=
22.	Electric Power Consumption Circumstance of Residential Building in a Mid-Long Term for Quanzhou City	CNKI http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=5&CurRec=1&recid=&filename=FJJZ201112012&dbname=CJFD1112&dbcode=CJFQ&pr=&urlid=&yx=&uid=WEEvREcwSlJHSldTTGJhYlNPQUFQUmc1NGhWSFdlUlpmamZ0MWtqbFRabFFTaWlMNm1HTW5WMElFMncrZG5sUQ==&v=MzE1NTJGeURtVnJyTUl5ZkJkTEc0SDlETnJZOUVab1I4ZVgxTHV4WVM3RGgxVDNxVHJXTTFGckNVUkxtZVp1WnI=
23.	The Strategy of Building Low-Carbon City in Tianjin: Based on Scenario Analysis of Carbon Emission	CNKI http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=6&CurRec=1&recid=&filename=DYYY201206022&dbname=CJFDLAST2013&dbcode=CJFQ&pr=&urlid=&yx=&uid=WEEvREcwSlJHSldTTGJhYlNPQUFQUmc1NGhWSFdlUlpmamZ0MWtqbFRabFFTaWlMNm1HTW5WMElFMncrZG5sUQ==&v=MjQ3NzlCSVRUU2Q3RzRIOVBNcVk5SFpvUjhlWDFMdXhZUzdEaDFUM3FUcldNMUZyQ1VSTG1lWnVackZ5RG1WNzc=
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28.	Jiang Kejun. "The Advantage of Cost in China's Development of Low-Carbon Economy: A Scenario Analysis for Energy and Emission in 2050." Green Leaf 5 (2009): 11-19.	
29.	Xu Minjie,et al. "Scenario analysis on mid-long term energy and electricity demand and carbon emission in China." Electric Power 45.4(2012):101-107.	
30.	Scenario Analysis of Energy Development During the process of Beijing building World City, Based on System Dynamics	CNKI http://www.cnki.com.cn/Article/CJFDTotal-DLGT200702014.htm
31.	Scenario analysis of resources and environmental problems of urban planning - Tianjin Binhai New Area	CNKI http://www.cnki.com.cn/Article/CJFDTotal-DLGT200702014.htm
32.	Scenario simulation on Wuxi's land use change , based on SLEUTH model	CNKI http://www.cnki.com.cn/Article/CJFDTotal-DLGT200702014.htm

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